ABSTRACT

Devices and methods for controlling brushless, sensorless DC motors are disclosed. In one embodiment, an electrical motor is provided with a rotor, a stator, and a semiconductor on insulator (SOI) application-specific integrated circuit (ASIC). The ASIC is configured to energize stator windings in a commutational sequence to drive the rotor. A motor controller embodiment is provided with a set of comparators and a clocked digital circuit. Each comparator determines a voltage polarity on a respective stator winding. The clocked digital circuit receives polarity signals from the comparators and detects zero crossings having an expected crossing direction, which are then used to determine a commutational sequence for energizing stator windings. A method embodiment is provided for driving DC motor windings. One method embodiment includes: receiving polarity signals, measuring intervals, and advancing a commutation state.